

## REMARKS

Upon entry of this amendment, claims 1-19 are pending. Based upon the remarks below, the Examiner is respectfully requested to provide favorable consideration and allow the claims.

### Claim Rejections- 35 USC § 102

Claims 1-4, 6, 10, 13 and 14 have been rejected under 35 USC § 102 as being anticipated by Goto et al US Patent No. 6,013,332 (“the Goto et al patent”). In order for there to be anticipation, each and every one of the elements of the claims must be found in a single reference. It is respectfully submitted that claims 1-4, 6, 13 and 14 recite elements not disclosed or suggested by the Goto et al patent. In particular, the claims 1 and 10 recite the step of: “producing a volume of gas phase molecules of a boron hydride  $B_nH_m$ , where n and m are integers and  $n > 10$  and  $m \geq 0$ ”. In the case of the Goto et al patent, the disclosure is limited to decaborane, i.e.,  $B_{10}H_{14}$ . In the case of decaborane  $B = 10$ . The claims at issue recite boron hydride molecules in which  $B > 10$  which excludes decaborane. As such, there can no anticipation of Claim 1. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection of claim 1.

With respect to claims 2-4, 13 and 14 these claims relate to producing octadecaborane,  $B_{18}H_{22}$  to form  $B_{18}H_{x+}$  or  $B_{18}H_{x-}$  ions. It is respectfully submitted that the Examiner’s characterization of Col. 2, lines 39-49 and Col. 2, lines 52-58 is misplaced. In particular, paragraph 5 of the Detailed Action states that “Goto teach(es) a method for producing a volume of gas molecules of *octadecaborane*, accelerating molecules of  $B_{18}H_{x+}$  and  $B_{18}H_{x-}$  “. It is respectfully submitted that the Goto et al patent does not disclose or suggest the production of *octadecaborane*  $B_{18}H_{22}$  molecules or ions. Rather, the Goto et al patent is limited strictly to decaborane  $B_{10}H_{14}$ .

The references cited in Paragraph 5 of the Detailed Action are provided below.

“Decaborane has a chemical formula of  $B_{10}H_{14}$ , and has a significantly larger mass number compared to a single boron atom. When a B ion and a  $B_{10}H_{14}$  ion of the same ion valency are accelerated by the same acceleration voltage, each B atom in the  $B_{10}H_{14}$  atom will gain an acceleration energy of about 1/10 compared to a single B atom, because  $B_{10}H_{14}$  has a mass of about 10 times as large as that

of B. Also, implantation of a single  $B_{10}H_{14}$  ion is equivalent to implantation of 10 B atoms. Therefore, the effective dose will also become 10 times as large as the implantation of a single B atom.” Col. 2, lines 39-49

“Thus, the expansion of the beam radius can be suppressed. Also, B atoms 10 times as many as those of the case of implanting B ions can be implanted at the same ion current, and the implantation efficiency becomes also 10 times as large as the case of implanting single B ions. As a total, implantation of  $B_{10}H_{14}$  will provide 100 times efficient boron implantation compared to implantation of B ions.” Col .2, lines 52-58

These citations clearly apply to decaborane and do not relate or suggest other molecular structures other than decaborane  $B_{10}H_{14}$ . Moreover, the Summary of the Invention states: “According to one aspect of the invention, there is provided a method of implanting ions comprising the steps of : vaporizing solid *decaborane*  $B_{10}H_{14}$  ...” Col. 2, lines 28-30. Indeed , all sixteen (16) claims of the Goto et al patent relate to *decaborane*  $B_{10}H_{14}$ . None of the claims relate to *octadecaborane*  $B_{18}H_{22}$ . In fact , the only molecular structures disclosed in the Goto et al patent are *decaborane*  $B_{10}H_{14}$  and  $BF_2$ . For all of the above reasons, there can be no anticipation of Claims 2-4, 13 and 14. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims. 2-4, 13 and 14 .

Claim 6 relates to accelerating a boron hydride ion into a silicon substrate. Claim 6 is dependent upon claim 1. As such claim 6 recites, in combination, boron hydride ions in which  $B > 10$ . In as much as the Goto et al patent does not disclose or suggest such ions, as set forth above, there can be no anticipation of claim 6. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection of claim 6.

### **Claim Rejections- 35 USC § 103**

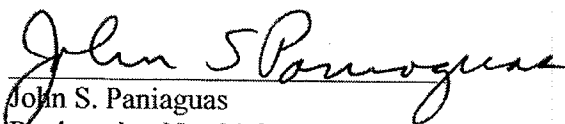
Claims 5, 7-9, 15 and 17-19 have been rejected under 35 USC § 103 (a) as being unpatentable over the Goto et al patent in view of Gregg et al US Patent Application Publication No. US 2005/0006799 A1 (“the Gregg et al publication”). Claims 5, 7 and 9 are dependent upon claim 1 and claims 15, 17 and 19 are dependent upon claim 10. As such these claims recite, in combination, boron hydride ions in which  $B > 10$ . As discussed above, the Goto et al patent does not disclose or suggest such ions. The Gregg et al publication also does not disclose boron hydride ions in which  $B > 10$ . Accordingly,

the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 5, 7-9, 15 and 17-19.

Claims 11 and 12 have been rejected under 35 USC § 103 (a) as being unpatentable over the Goto et al patent in view of Horsky et al US Patent Application Publication No. US 2004/0002202 A1<sup>1</sup> ("the Horsky et al publication"). Claims 11 and 12 are dependent upon claim 10. As such these claims recite, in combination, boron hydride ions in which  $B > 10$ . As discussed above, the Goto et al patent does not disclose or suggest such ions. The Horsky et al publication also does not disclose boron hydride ions in which  $B > 10$ . Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 11 and 12.

Respectfully submitted,

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<sup>1</sup> The Publication No. US 2004/002202 A1 as recited in Paragraph 11 of the Detailed Action is incorrect. The Applicant assumes that the correct publication no. is US 2004/0002202.